ORDER NO. ARD81060055C8-07

Service Manual

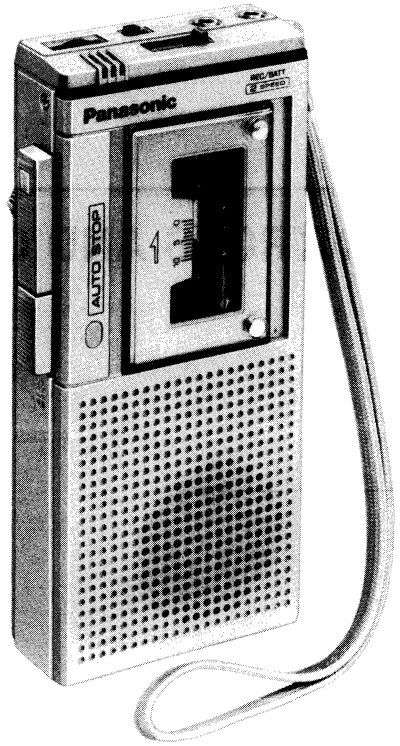
Microcassette

RN-Z01D

(Silver)

AC/Battery Microcassette Recorder with Two-Speed, Tape Selector and Tape Counter

This is the Service Manual for the following areas.
- [E] ..... For European areas.
- [N] ..... For Asia, Latin America, Middle East and Africa areas.
- [A] ..... For Australia.



RN-Z06 MECHANISM SERIES

Specifications

Power requirement:
- [E] ..... AC; with optional AC adaptor RP-31
  Battery; 3 V (two R6 size dry batteries)
- [N] ..... AC; with optional AC adaptor RP-34
  Battery; 3 V (two UM-3 size dry batteries)
- [A] ..... Battery; 3 V (two UM-3 size dry batteries)

Motor: Electric governor motor
Power output: 400 mW ··· RMS (max)
Frequency range: 200 — 6,000 Hz
Tape speed: 2-speed system 1.2 cm/s, 2.4 cm/s
Program time: 2 hours with RT-60MC microcassette tape (at 1.2 cm/s)
1 hour with RT-60MC microcassette tape (at 2.4 cm/s)

Fast forward and rewind time: Approx. 120 seconds with RT-60MC cassette tape
Track system: 2-track monaural recording and playback
Inputs: MIC; sensitivity 0.25 mV/applicable microphone impedance 200Ω — 600Ω
DC in; 3 V
Output: Monitor; 8Ω
Speaker: 4.5 cm PM dynamic speaker
Dimensions: 64 mm (W) × 142.5 mm (H) × 25.8 mm (D)
Weight: 240 g, without batteries

Specifications are subject to change without notice.

National / Panasonic

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

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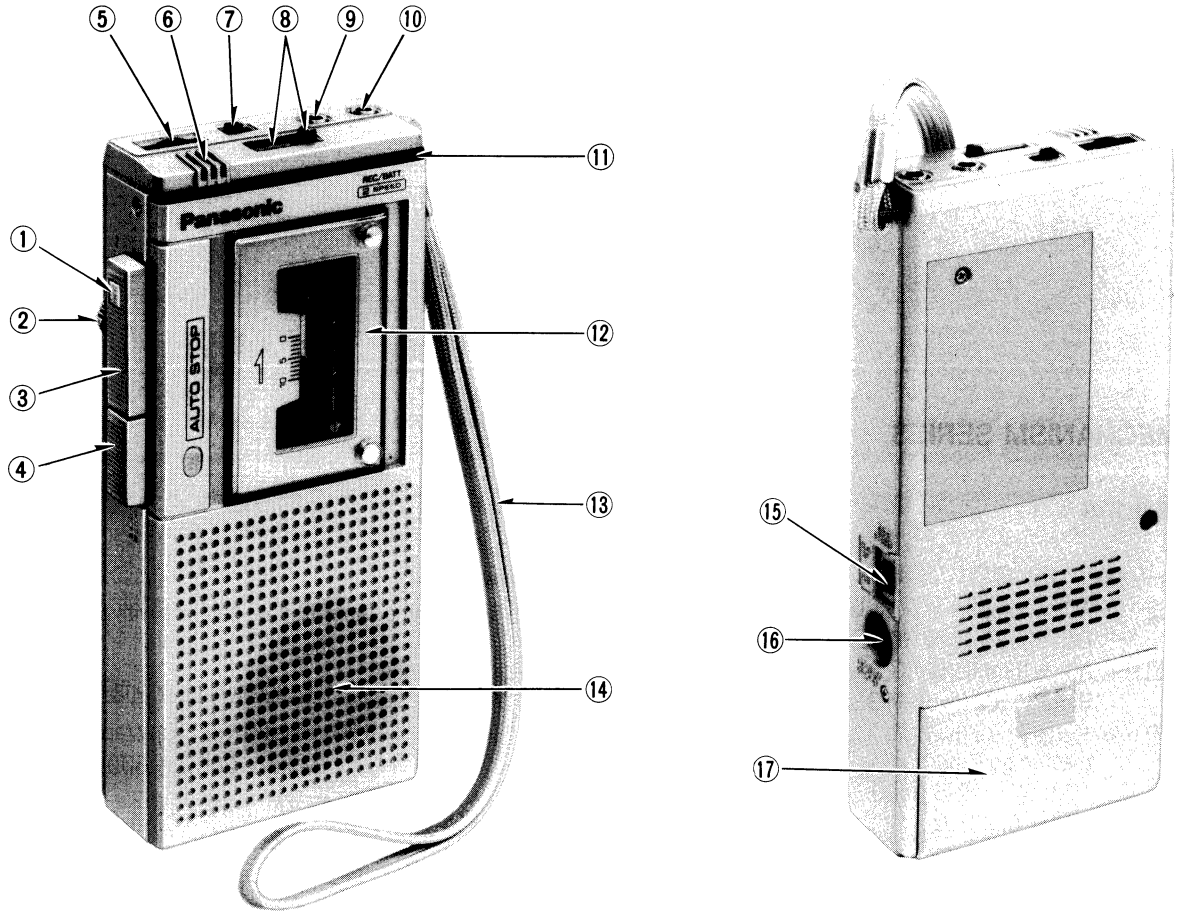
LOCATION OF CONTROLS AND COMPONENTS



① Record button
② Cue/fast forward review/rewind switch
③ Playback button
④ Eject/stop button
⑤ Volume control
⑥ Built-in microphone
⑦ Pause control
⑧ Tape counter and reset button
⑨ Microphone jack
⑩ Monitor jack
⑪ Recording-indicator/ battery-check lamp
⑫ Cassette compartment cover
⑬ Handstrap
⑭ Built-in speaker
⑮ Tape-speed selector
⑯ DC IN jack
⑰ Battery cover

DISASSEMBLY INSTRUCTIONS

Notes:

1. Because this unit is very small, and therefore the screws are also especially small, be careful not to lose any parts during disassembly.
2. Be very careful, when replacing parts or checking, not to damage the lead wiring, because it is much thiner than lead wiring used in other sets.

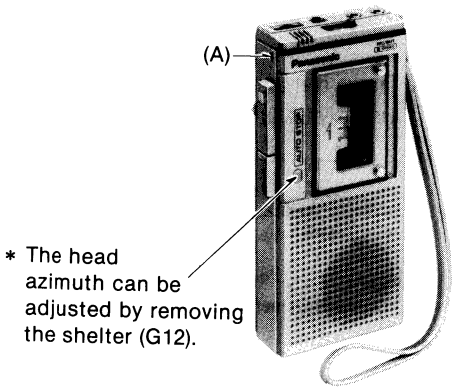


Fig. 1

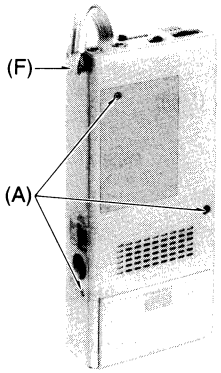


Fig. 2

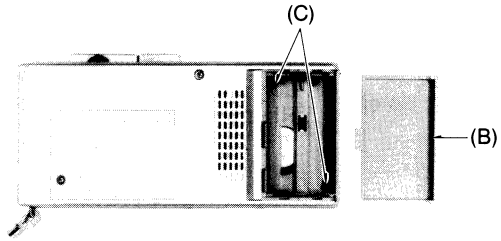


Fig. 3

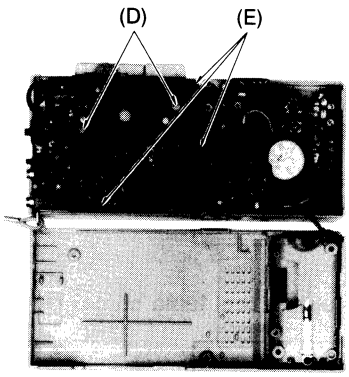


Fig. 4

Procedure	To remove —— .	Remove —— .	Shown in fig. —— .
1	Bottom case assembly	• 4 screws ..... (A) • Battery cover ..... (B) • 2 black screws ..... (C)	1, 2 3 3
2	Circuit board	• 2 screws ..... (D)	4
3	Mechanism unit	• 3 red screws ..... (E) • 1 screw ..... (F)	4 2

Assembly notes:

- When installing the printed circuit board on the mechanism unit, note the following:
  - A. Check to be sure that the boss of switch lever (M74) and record/playback select switch (S1) are in the correct position, as shown in fig. 5.
  - B. Check to be sure that the boss of switch lever (M36) and playback ON/OFF switch (S4) are in the correct position, as shown in fig. 5.
  - C. Check to be sure that the leaf switch (S5) between the bosses of the fast wind plate assembly (M52) is properly positioned, as shown in fig. 5.

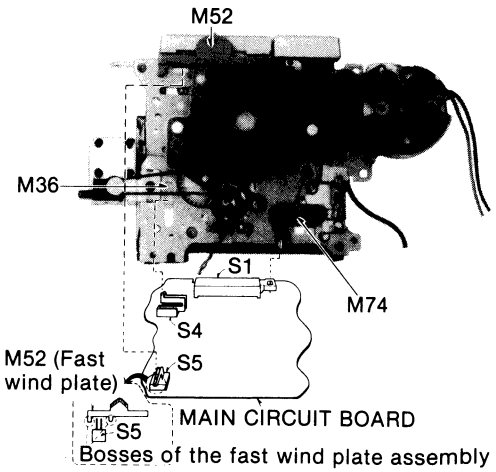
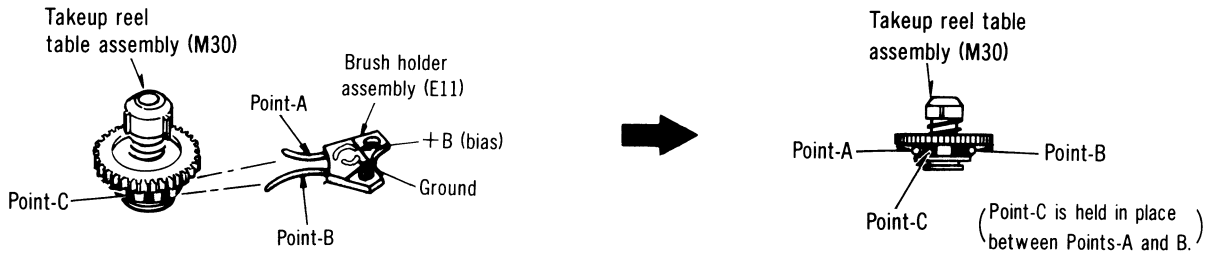


Fig. 5

TECHNICAL EXPLANATION

Auto-stop operation

When the takeup reel table stops rotating at the end of tape, this function, 4 to 7 seconds later, automatically cuts off power supply, thereby eliminating any waste of power consumption.
A combination switch (S6) is used for detection of the takeup reel table rotation, and consists of the takeup reel table assembly (M30) and the brush holder assembly (E11).
(See the following diagram.)



• When the takeup reel table rotates

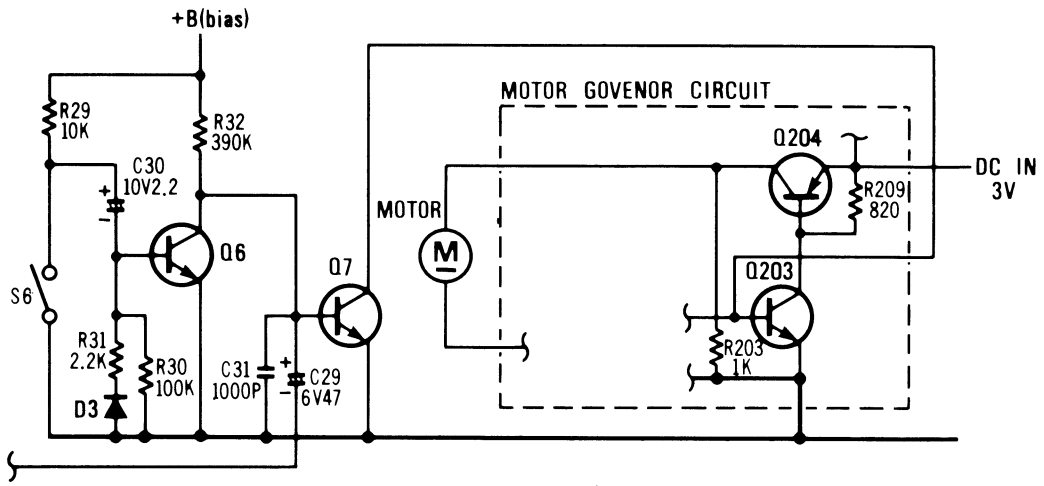
S6 repeats ON/OFF. → C30 repeats charging/discharging. → Q6 repeats ON/OFF. → Base potential of Q7 is Ⓛ, keeping Q7 in the OFF condition. → Base potential of Q203 is Ⓗ, keeping Q203 in the ON condition. → Base potential of Q204 is Ⓛ, keeping Q204 in the ON condition. ⇨ Power supply continues to the motor.

Notes: Ⓛ: Low potential.
Ⓗ: High potential.

• When the takeup reel table stops

S6 becomes either ON or OFF. → Base potential of Q6 becomes Ⓛ. → Q6 becomes OFF; collector potential becomes Ⓗ. → Q7 becomes ON; collector potential becomes Ⓛ. → Q203 becomes OFF; collector potential becomes Ⓗ. → Q204 becomes OFF. ⇨ Power supply to the motor is cut off.

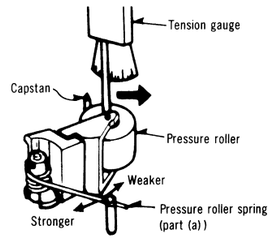
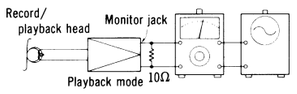
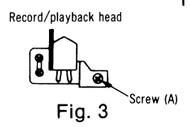
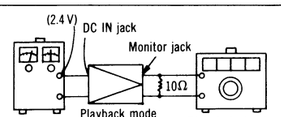
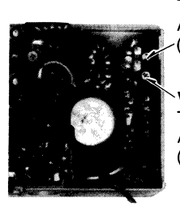
Notes: Ⓛ: Low potential.
Ⓗ: High potential.



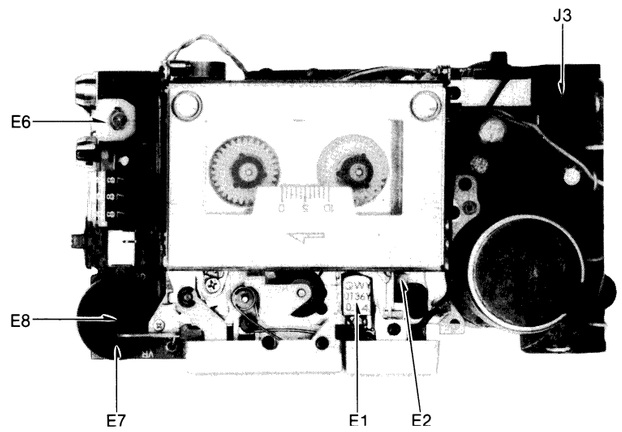
MEASUREMENT AND ADJUSTMENT METHODS

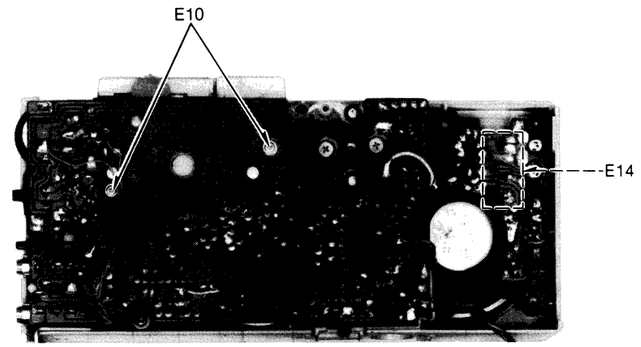
NOTES: Keep good condition, set switch button and control in the following positions, unless otherwise specified.

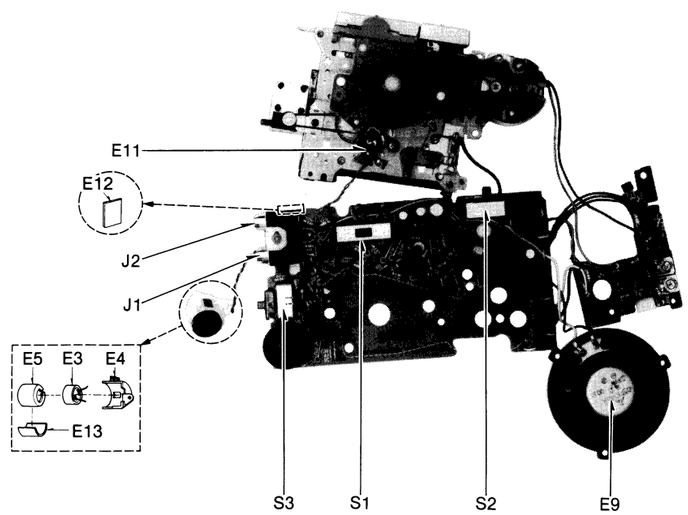
- Make sure heads are clean.
- Make sure capstan and pressure roller are clean.
- Judgeable room temperature: 20±5°C (68±9°F).
- Pause switch: OFF.
- Volume control: Maximum.

ITEM	MEASUREMENT & ADJUSTMENT
Ⓐ Pressure of pressure roller Condition: * Playback mode Equipment: * Tension gauge	1. Prepare unit for playback. 2. Connect the tension gauge to the pressure roller lever, and pull it in the direction of the arrow, as shown in fig. 1. 3. Measure the tension at the moment when the pressure roller moves away from the capstan. Standard pressure: 185±25 g 4. If the pressure is out of tolerance, bend the pressure roller lever spring (part (a)) in either direction shown by the arrow until the correct pressure is attained.  Fig. 1
Ⓑ Head azimuth adjustment Condition: * Playback mode Equipment: * VTVM * Oscilloscope * Test tape (azimuth) ··· QZZMWC * Resistor (10Ω)	1. Test equipment connection is shown in fig. 2. 2. Playback azimuth tape (QZZMWC). 3. Adjust record/playback head angle adjustment screw (A) in fig. 3 so that output level becomes maximum. 4. After adjustment lock head adjustment screw with lacquer.  Fig. 2  Fig. 3
Ⓒ Check after motor replacement Condition: * Playback mode	1. After replacing the motor, playback the test tape (QZZMWC) and listen to the reproduced sound. If the sound vibrates or fluctuates, replase the resistor of the motor circuit according to the following procedure. 2. Remove selectable resistor R101 from the printed circuit board (mentioned on the page 6) and then measure the resistance value. 3. Select a resistor whose resistance value is next lowest to the measured value from amount those mentioned in the table 1, and then solder it to the circuit. 4. Playback the test tape (QZZMWC) and check that the reproduced sound does not fluctuate. 5. If the sound still fluctuates, replace the resistor with one of lower resistance. ERD10TJ270 27Ω ERD10TJ220 22Ω ERD10TJ180 18Ω ERD10TJ150 15Ω ERD10TJ120 12Ω ERD10TJ100 10Ω ERD10TJ8R2 8.2Ω **Table 1**
Ⓓ Tape speed accuracy adjustment Condition: * Playback mode Equipment: * Digital electronic counter or frequency counter * DC power supply * Test tape ··· QZZMWC * Resistor (10Ω)	• Measurement 1. Test equipment connection is shown in fig. 4. 2. Playback test tape (QZZMWC) and supply playback signal to digital electronic counter. 3. If measured values are not within standard, adjust as follows; Standard value: At 2.4cm/sec.: 3000±90 Hz At 1.2cm/sec.: 1500±75 Hz • Tape speed adjustment 1. Set the tape speed selector (S2) to 2.4cm/s position. 2. Adjust VR201 so that frequency becomes within 3000±90Hz (Shown in fig. 5). 3. Set the tape speed selector (S2) to 1.2cm/s position. 4. Adjust VR202 so that frequency becomes within 1500±75Hz (Shown in fig. 5).  Fig. 4  Fig. 5

ELECTRICAL PARTS LOCATION



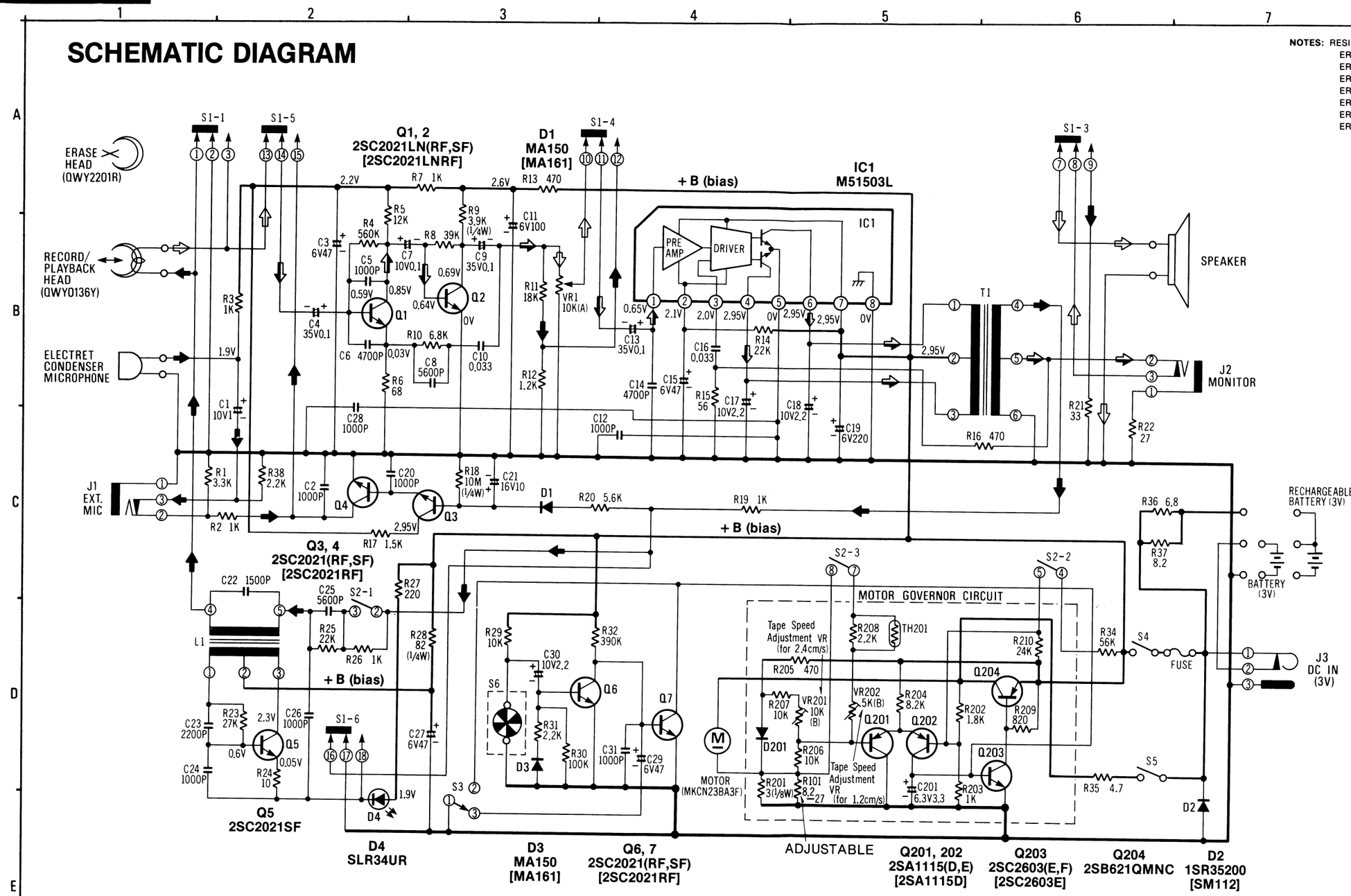




REPLACEMENT PARTS LIST

Ref. No.	Part No.	Part Name & Description
	ELECTRICAL PARTS	
E1	QWY0136Y	Record/Playback Head
E2	QWY2201R	Erase Head
E3	WM063Y	Electret Condenser Microphone
E4	QKJ0402	Microphone Holder
E5	QBG1687	Microphone Rubber
E6	QKJ0403	LED Holder
E7	QGT1498	Volume Knob
E8	XQN17B28FZ	Screw +1.7×2.8
E9	EAS45P104SA	Speaker
E10	XQNQC16A22FN	Tapping Screw +1.6×2.2
E11	QES1541	Brush Holder Assembly
E12	QTW1242	Insulating Sheet (for Monitor Jack)
E13	QTW1226	Insulating Sheet (for Microphone Rubber)
E14	QTWA0007	Insulating Sheet (for Motor Governor Circuit Board)

SCHEMATIC DIAGRAM



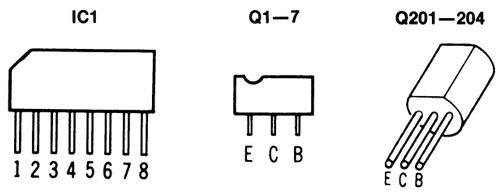
NOTES: RESISTORS
ERD...Carbon
ERG...Metal-oxide
ERO...Metal-film
ERX...Metal-film
ERQ...Fuse type metallic
ERC...Solid
ERF...Cement

CAPACITORS
ECG□.....Ceramic
ECK□.....Ceramic
ECC□.....Ceramic
ECF□.....Ceramic
ECQM.....Polyester film
ECQE.....Polyester film
ECQF.....Polypropylene
ECE□.....Electrolytic
ECE□N ...Non polar electrolytic
ECQS.....Polystyrene
ECS□.....Tantalum

REPLACEMENT PARTS LIST

Ref. No.	Part No.
RESISTORS	
R1	ERD10TJ332
R2, 3	ERD10TJ102
R4	ERD10TJ564
R5	ERD10TJ123
R6	ERD10TJ680
R7	ERD10TJ102
R8	ERD10TJ393
R9	ERD25FJ392
R10	ERD10TJ682
R11	ERD10TJ183
R12	ERD10TJ122
R13	ERD10TJ471
R14	ERD10TJ223
R15	ERD10TJ560
R16	ERD10TJ471
R17	ERD10TJ152
R18	ERC14GJ106
R19	ERD10TJ102
R20	ERD10TJ273
R21	ERD10TJ330
R22	ERD10TJ270
R23	ERD10TJ273
R24	ERD10TJ100
R25	ERD10TJ223
R26	ERD10TJ103
R27	ERD10TJ221
R28	ERD25FJ820
R29	ERD10TJ103
R30	ERD10TJ104
R31	ERD10TJ222
R32	ERD10TJ394
R34	ERD10TJ563
R35	ERD10TJ4R7
R36	ERD10TJ6R8
R37	ERD10TJ8R2
R38	ERD10TJ222
R101	ERD10TJ8R2
	ERD10TJ100
	ERD10TJ120
Selectable	ERD10TJ150
	ERD10TJ180
	ERD10TJ220
	ERD10TJ270
R201	ERSA39J3R0
R202	ERD10TJ182
R203	ERD10TJ102
R204	ERD10TJ822
R205	ERD10TJ471
R206, 207	ERD10TJ103
R208	ERD10TJ222
R209	ERD10TJ821
R210	ERD10TJ243
VARIABLE RESISTORS	
VR1	EVLEAAT12A14
VR201	EVMA6AA00B14
VR202	EVMA6AA00B53
CAPACITORS	
C1	ECSF10E1
C2	ECFDD102KVY
C3	ECEA1AS470
C4	ECSF1AM105
C5	ECFDD102KVY
C6	ECFDD472KVY
C7	ECSF1VM104
C8	ECFDD562KVY
C9	ECSF1VM104
C10	ECFDD333KVY
C11	ECEA1AS101
C12	ECFDD102KVY
C13	ECSF35ER1
C14	ECFDD472KVY
C15	ECEA1AS470
C16	ECFDD333KVY
C17, 18	ECSF10E2R2
C19	ECEA0JV221
C20	ECFDD102KVY
C21	ECEA1CK100
C22	ECFDD152KVY
C23	ECFDD222KVY
C24	ECFDD102KVY
C25	ECFDD562KVY
C26	ECFDD102KVY
C27	ECEA1AS470
C28	ECFDD102KVY
C29	ECEA0JK470
C30	ECSF1AM225
C31	ECFDD102KVY
C201	QCSF0JM335N
TRANSISTORS	
Q1, 2	2SC2021LNRF
Q3, 4	2SC2021RF
Q5	2SC2021SF
Q6, 7	2SC2021RF
Q201, 202	2SA1115D
Q203	2SC2603E
Q204	2SB621QMNC
DIODES	
D1	MA161
D2	SM112
D3	MA161
D4	SLR34UR
D201	HV23GMC
INTEGRATED CIRCUIT	
IC1	M51503L
THERMISTOR	
TH201	TD5C268

TERMINATIONS (SIDE VIEW)



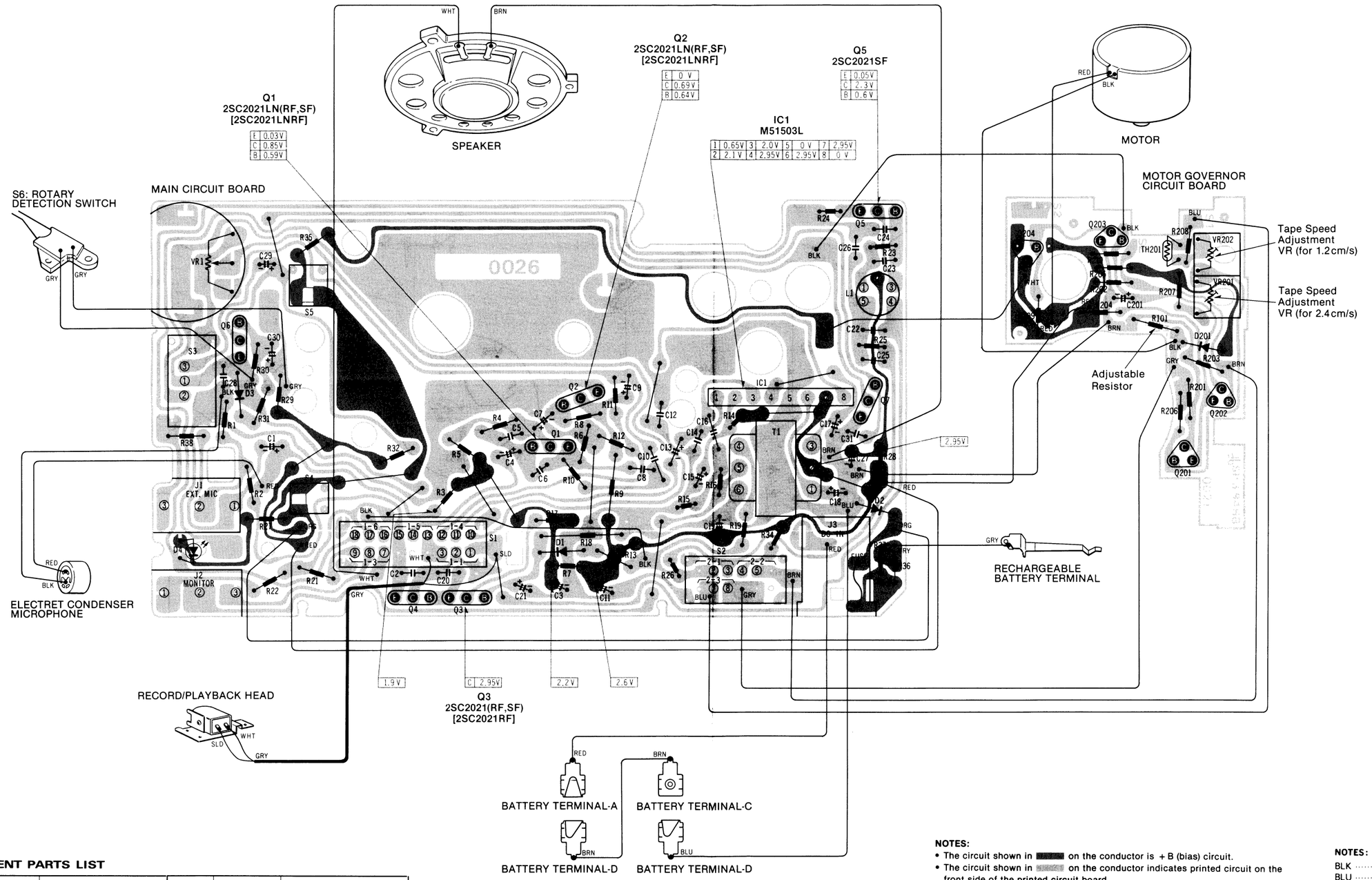
NOTES:
- S1-1—S1-6 .....Record/playback select switch (shown in playback position).
- S2-1—S2-3 .....Tape speed select switch (shown in 2.4cm/s position).
- S3.....Pause LOCK/OFF switch (shown in lock position).
- S4.....Playback ON/OFF switch (shown in off position).
- S5.....Fast wind ON/OFF switch (shown in off position).
- S6.....Rotary detection switch.
- VR1 .....Volume control VR.
- Resistance are in ohms (Ω), 1/8 watt unless specified otherwise. K = 1,000Ω. M = 1,000KΩ.
- Capacity are in microfarads (μF) unless specified otherwise. P = Pico-farads.
- All voltage values shown in circuitry are under no signal condition and record mode with volume control at minimum position. For measurement, use VTVM.

- (⇨) this arrow indicates the flow of the playback signal.
- (➡) this arrow indicates the flow of the recording signal.
- (⇒) this arrow indicates the flow of the playback and recording signal in combination.
- Described in the schematic diagram are two types of numbers; the supply parts number and production parts number for transistors and diodes. One type of number is used for supply parts number and production parts number when they are identical.
  e.g. Q1
  {2SC2021LN(RF,SF)—Production parts number
  {[2SC2021LNRF] —Supply parts number
  D1
  {MA150 —Production parts number
  {[MA161]—Supply parts number
- **The supply parts number is described alone in the replacement parts list.**

SPECIFICATIONS

Bias oscillation frequency	51 ± 15 kHz
Standard recording input level	MIC: −72 ± 4 dB (2.4 cm/s) −76 ± 4 dB (1.2 cm/s)
Bias current	0.48 ± 0.1 mA

CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM



REPLACEMENT PARTS LIST

Ref. No.	Part No.	Part Name & Description
		TRANSFORMER
T1	QLT2D34X	Output Transformer
		COIL
L1	QLB0195	Bias Oscillation Coil
		SWITCHES
S1	QSS6216	Slide Switch (Record/Playback Selector)
S2	QSS4215	Slide Switch (Tape Speed Selector)
S3	QSS1223	Slide Switch (Pause Lock ON/OFF)
S4	QSB0255	Leaf Switch (Playback ON/OFF)
S5	QSB0256	Leaf Switch (Fast Wind ON/OFF)
S6	Refer to E11 & M30	Combination Switch (Rotary Detector)
		JACKS
J1, 2	QJA0162	M3 Jack (MONITOR, EXT MIC)
J3	QJA0149	DC IN Jack

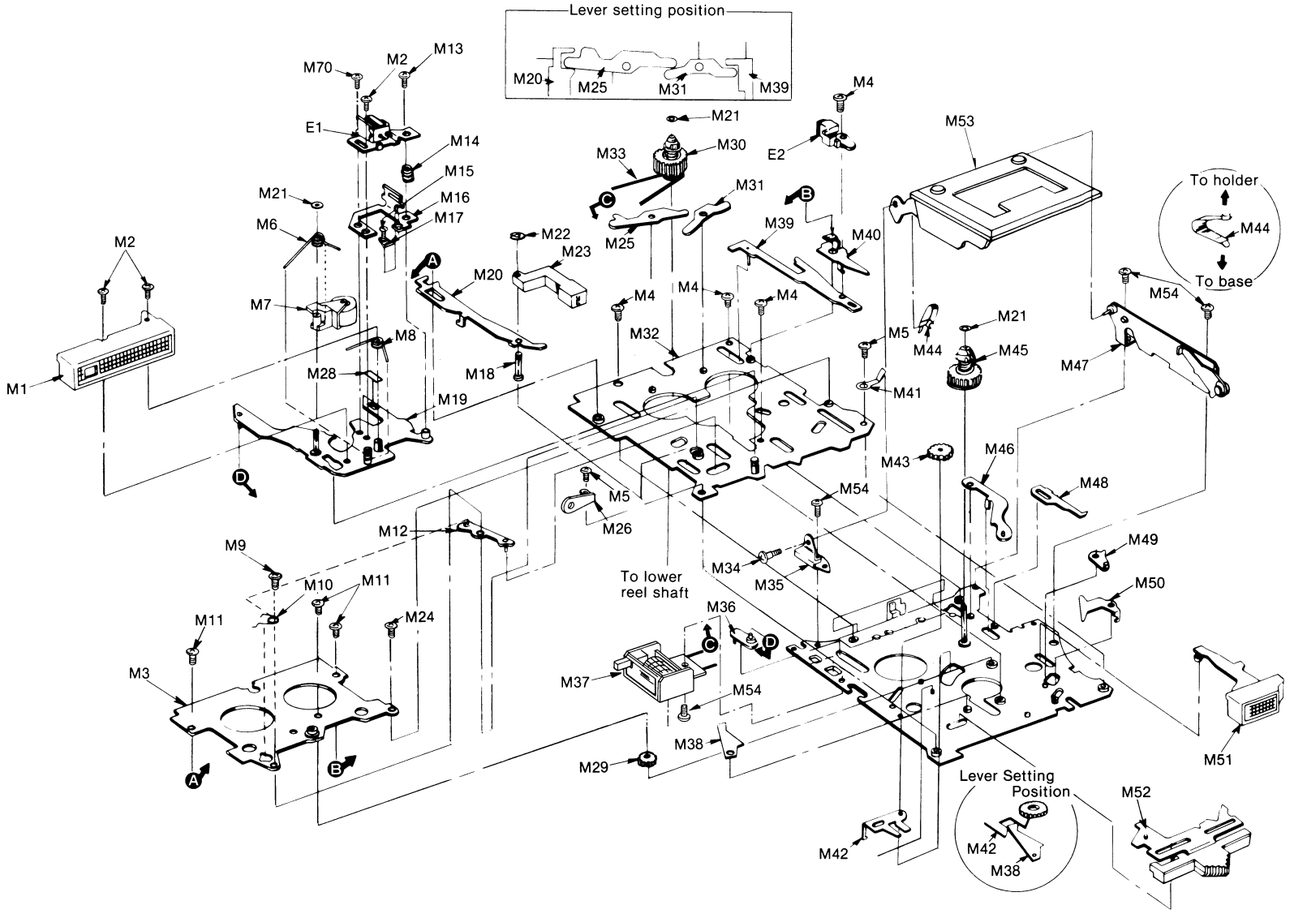
NOTES:

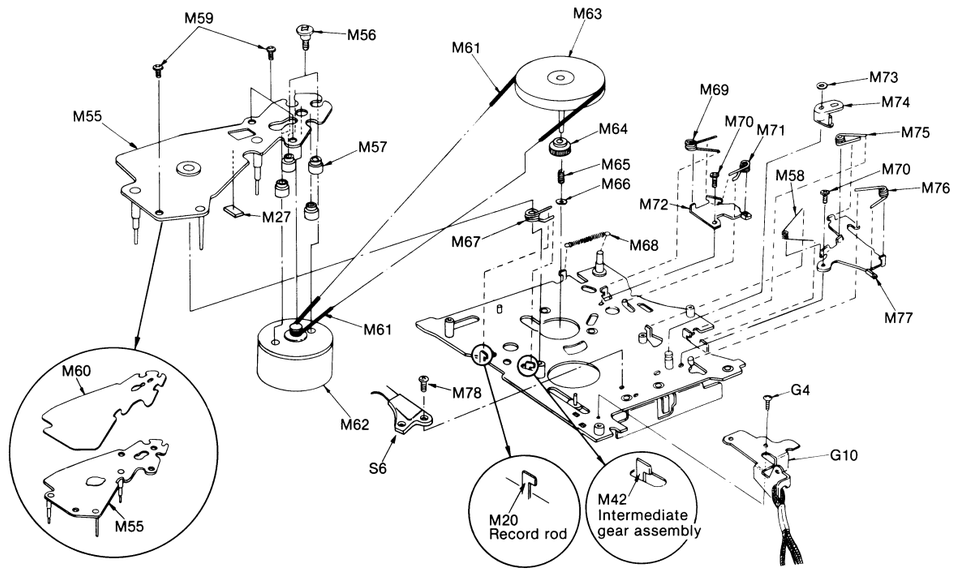
- The circuit shown in ▬ on the conductor is + B (bias) circuit.
- The circuit shown in ▒ on the conductor indicates printed circuit on the front side of the printed circuit board.
- Values indicated in ▭ are DC voltage between the ground and electrical parts.
- Described in the circuit boards and wiring connection diagram are two types of numbers; the supply parts number and production parts number for transistors.
  One type of number is used for supply parts number and production parts number when they are identical.
  e.g. Q1
  {2SC2021LN(RF,SF)——Production parts number
  {[2SC2021LNRF] ——Supply parts number
- **The supply parts number is described alone in the replacement parts list.**

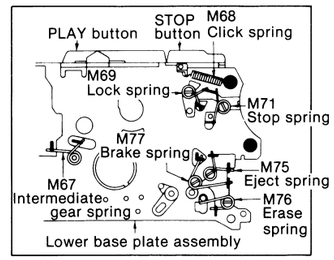
NOTES:

BLK ..... Black
BLU ..... Blue
BRN ..... Brown
GRY ..... Gray
GRN ..... Green
L BLU ... Light Blue
NIL ..... No Color Mark
ORG ..... Orange
PNK ..... Pink
RED ..... Red
SLD ..... Shield Wire
VLT ..... Violet
WHT ..... White
YEL ..... Yellow

MECHANICAL PARTS LOCATION







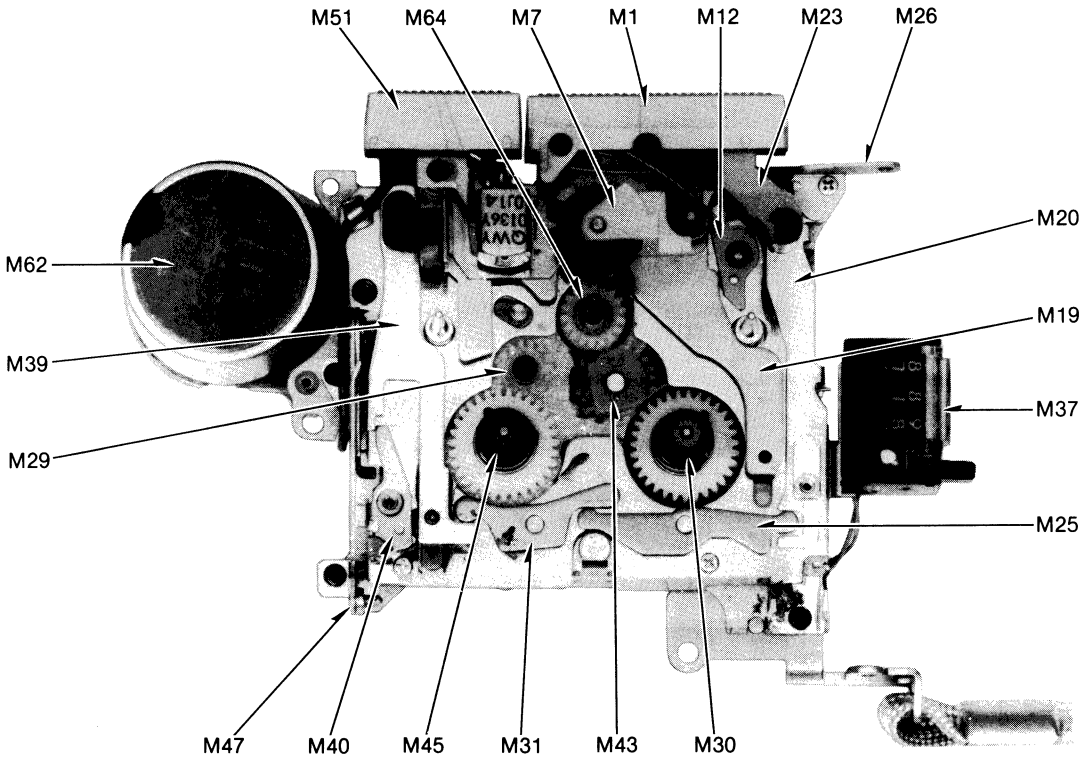
REPLACEMENT PARTS LIST

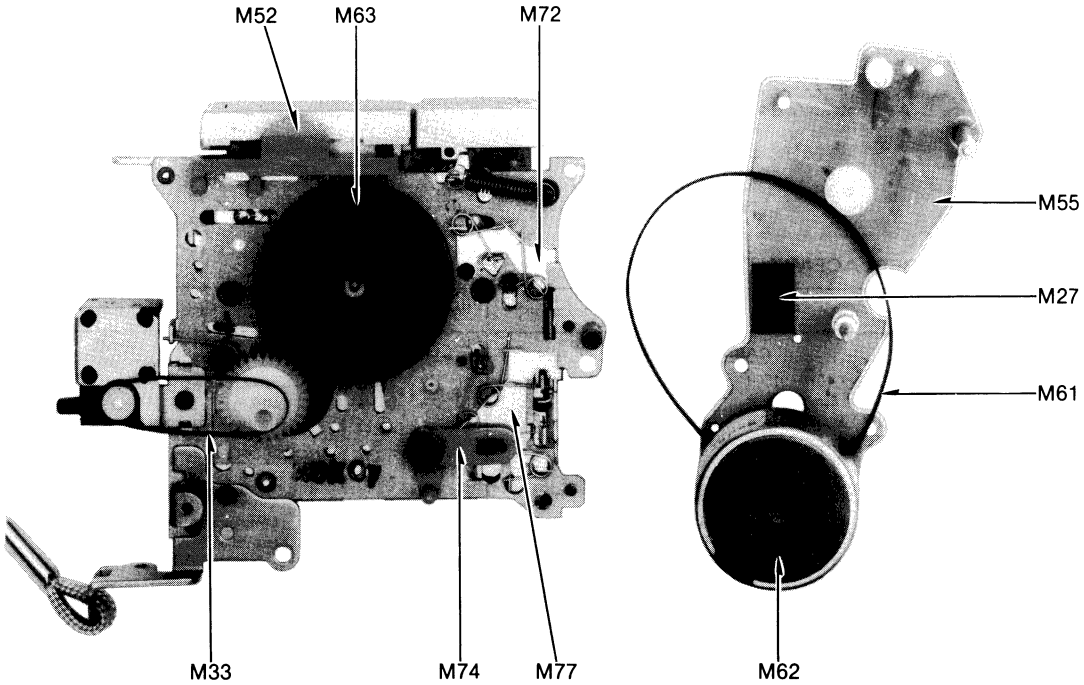
Ref. No.	Part No.	Part Name & Description
	MECHANICAL PARTS	
M1	QG01703	Playback Button Assembly
M2	XQN16A2FZ	Screw ⌖1.6×2
M3	QXK2255	Reflection Plate Assembly
M4	XQN16C25FZ	Screw ⌖1.6×2.5
M5	XQNQ16A25F	〃
M6	QBN1632	Pressure Roller Spring
M7	QXL1380	Pressure Roller Arm Assembly
M8	QBN1628	Playback Spring
M9	QHQ1254	Step Screw
M10	QBN1738	Record Lock Spring
M11	XQS14A14FC	Screw ⌖1.4×1.4
M12	QXL1379	Record Lock Lever Assembly
M13	QHQ1281	Head Adjustment Screw
M14	QBC1331	Head Spring
M15	XQN14C14FZ	Clamper Screw
M16	QMG0063	Tape Guide
M17	QTD1268	Lead Clamper
M18	QMN2340	Pole for Record Button
M19	QXK2257	Head Base Plate Assembly
M20	QMR1826	Record Rod
M21	QBW2081	Poly Washer
M22	XUC15FT	Stop Ring
M23	QGO1491	Record Button
M24	XQN16A16FN	Screw ⌖1.6×1.6
M25	QML3397	Reversing Lever-A
M26	QMA3954	Panel Hold Angle
M27	QBJ1500	Belt Spacer
M28	QTW1255	Spacer
M29	QDG1156	Rewind Gear
M30	QXD0126	Takeup Reel Table Assembly
M31	QML3398	Reversing Lever-B
M32	QXK2252	Upper Base Plate Assembly
M33	QDB0271	Counter Belt
M34	QHQ1308	Step Screw
M35	QMA3886	Holder Angle
M36	QMF2143	Switch Lever
M37	QXA1143	Tape Counter Assembly
M38	QMF2006	Rewind Base Plate
M39	QXR0628	Erase Rod Assembly
M40	QML3400	Record Detection Lever
M41	QTD1258	Lug Terminal
M42	QXH0295	Intermediate Gear Plate Assembly
M43	QDG1237	Intermediate Gear
M44	QBP1878	Plate Spring-B
M45	QXD0093	Supply Reel Table Assembly
M46	QXL1237	Brake Arm Assembly
M47	QXA0729	Eject Angle Assembly
M48	QMF1998	Eject Plate
M49	QXL1236	Lock Lever Assembly
M50	QMF2000	Check Plate
M51	QXR0637	Stop Rod Assembly
M52	QXH0343	Fast Wind Plate Assembly
M53	QXA1065	Holder Assembly
M54	XTNQ16C2FFZ	Screw ⌖1.6×2
M55	QXK2367	Motor Holding Plate Assembly
M56	QHQ1298	Step Screw
M57	QBG1673	Motor Cushion
M58	QBN1633	Brake Spring
M59	XQS16A3FZ	Screw ⌖1.6×3
M60	QTW1224	Motor Insulation Plate
M61	QDB0272	Flywheel Belt
M62	MKCN23BA3F	DC Motor
M63	QXF0162	Flywheel Assembly
M64	QDG1204	Flywheel Gear
M65	QBC1354	Flywheel Spring
M66	QBW2060	Poly Washer
M67	QBN1737	Intermediate Gear Spring
M68	QBT1855	Click Spring
M69	QBN1635	Lock Spring
M70	XQN16A14FZ	Screw ⌖1.6×1.4
M71	QBN1631	Stop Spring
M72	QMF2100	Spring Hook Plate-B
M73	QBW2007	Snap Washer
M74	QML3647	Switch Lever
M75	QBN1627	Eject Spring
M76	QBN1736	Erase Spring
M77	QMF2099	Spring Hook Plate-A
M78	XQN16C28FN	Screw ⌖1.6×2.8

SPECIFICATIONS

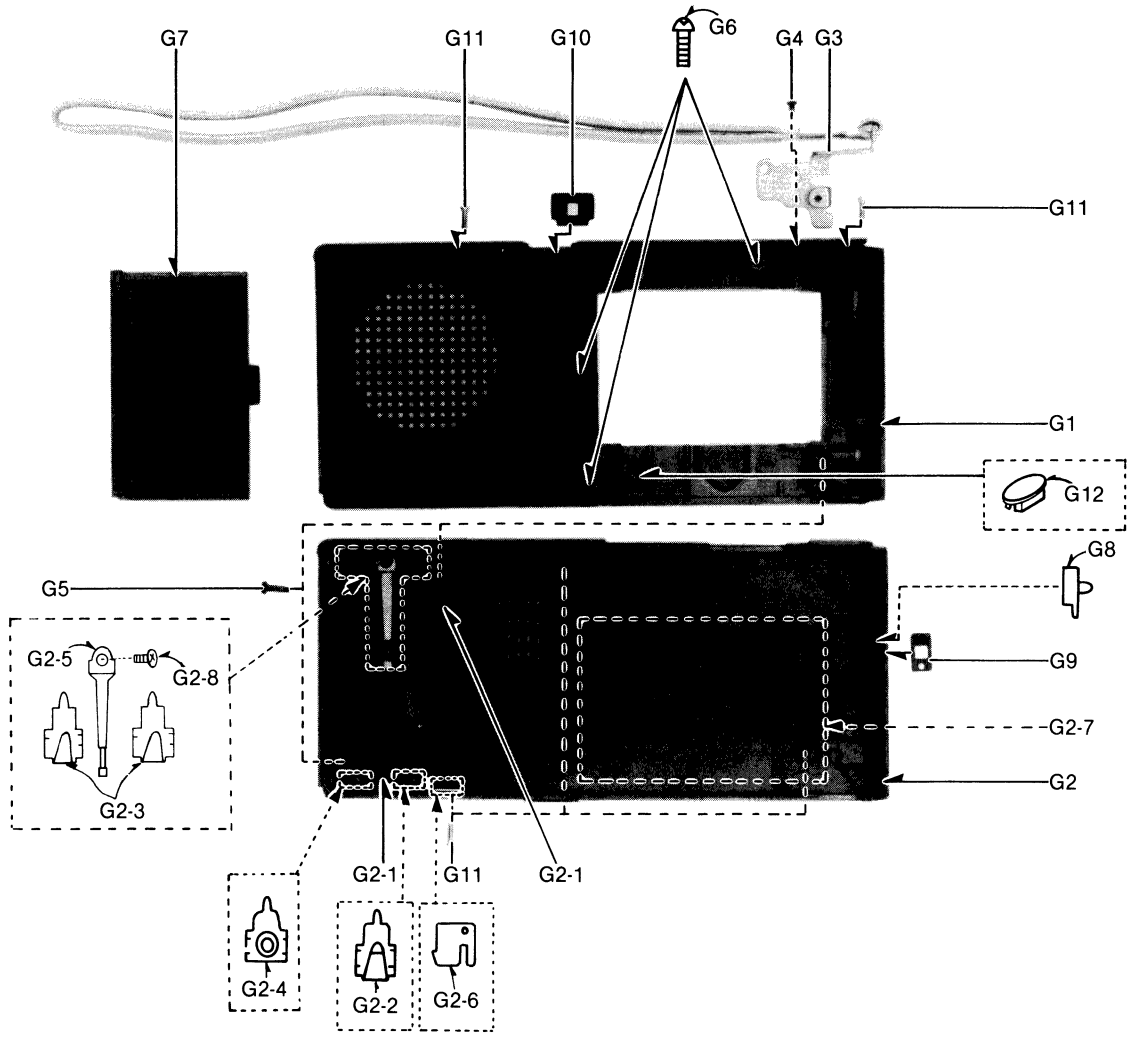
ITEM	VALUE	REMARKS
Wow and flutter (JIS)	RMS: 2.4 cm/s; Less than 0.55% 1.2 cm/s; Less than 1.1%	Use 3 kHz test tape (QZZMWC)

MECHANISM PARTS LOCATION





CABINET PARTS LOCATION



REPLACEMENT PARTS LIST

Ref. No.	Part No.	Part Name & Description
		CABINET PARTS
G1	Ⓔ QYMA0150H	Main Case Assembly
	※For all European areas.	
	ⓃⒶ QYMA0148H	〃
	※For Asia, Latin America, Middle East, Africa areas and Australia.	
G2	QYMA0149H	Bottom Case Assembly
G2-1	QBG1686	Speaker Holding Rubber
G2-2	QJB0109	Battery Terminal-A
G2-3	QJB0147	Battery Terminal-D
G2-4	QJB0142	Battery Terminal-C
G2-5	QJB0143	Rechargeable Battery Terminal
G2-6	QMF2113	Main Case Holding Plate
G2-7	QGS2919	Main Name Plate
G2-8	XTN2+6B	Tapping Screw ⊕2×6
G3	QYH0093	Hand Strap Assembly
G4	XTN16+22FFZ	Tapping Screw ⊕1.6×2.2
G5	XTN2+8B	Tapping Screw ⊕2×8
G6	XTN2+6B	Tapping Screw ⊕2×6
G7	QKF4027H	Battery Cover
G8	QGT1494	Switch Knob (for Pause Switch)
G9	QQC1646	Switch Shelter (for Pause Switch)
G10	QQC1648	Switch Shelter (for Tape Speed Selector Switch)
G11	XQN16C5FN	Screw ⊕1.6×5
G12	QKJ0411H	Shelter (for Head Adjustment Screw)
		ACCESSORIES
A1	QFK0159	Soft Case
A2	XEH15A1D	Earphone
A3	QFT20CDNPY	Demonstration Tape
A4	Ⓔ QQT3080	Instruction Book
	※For all European areas.	
	ⓃⒶ QQT3068	〃
	※For Asia, Latin America, Middle East, Africa areas and Australia.	
		PACKINGS
P1	Ⓔ QPN4213	Inside Carton
	※For all European areas.	
	ⓃⒶ QPN4212	〃
	※For Asia, Latin America, Middle East, Africa areas and Australia.	
P2	QPA0564	Cushion
P3	XZB11X20A02	Poly Bag (for UNIT)
P4	QPS0482	Pad

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